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May 16, 2006

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Serial No. 06-251
NLOS/PRW R0
Docket No. 50-423
License No. NPF-49

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3
RELAXATION OF THE REQUIREMENTS OF ORDER EA-03-009 REGARDING REACTOR PRESSURE VESSEL HEAD INSPECTIONS, REQUEST IR-2-46

Dominion Nuclear Connecticut, Inc. (DNC) hereby submits alternative request IR-2-46 seeking relaxation of requirements of Section IV.C(5)b of the NRC's Order EA-03-009 (Order), issued on February 20, 2004.[1] The NRC Order establishes inspection requirements for the reactor pressure vessel (RPV) head. DNC will be unable to perform ultrasonic testing (UT) to the extent required by the Order at the bottom of five core exit thermocouple (CET) nozzles during the Millstone Power Station Unit 3 (MPS3) spring 2007 refueling outage.

This request is made pursuant to provisions of the Order, Section IV.F(2), regarding relaxation of requirements, which states that requests for relaxation associated with specific penetration nozzles will be evaluated by the NRC staff using its procedure for evaluating proposed alternatives to the ASME Boiler and Pressure Vessel Code (ASME Code) in accordance with 10 CFR 50.55a(a)(3). DNC requests approval of the proposed relaxation request to support inspection activities that are scheduled during the MPS3 spring 2007 refueling outage.

Should you have any questions regarding this submittal, please contact Mr. Paul R. Willoughby at (804) 273-3572.

Very truly yours,

Eugene S. Grecheck
Vice President – Nuclear Support Services

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(1) NRC letter, "Issuance of First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors," February 20, 2004 (ADAMS Accession No. ML040220181)

Attachments: (1)

1. Relaxation of the Requirements of Order EA-03-009 (Request IR-2-46)

Commitments made in this letter: (Attachment 1, Section 5.2.3)

1. A structural integrity evaluation of the five CET nozzles will be completed to support continued operation until the next inspection is performed. This evaluation will derive a minimum effective full power years (EFPY) estimate for the period of time it takes to reach the bottom of the J-groove weld area for any postulated undetected flaw in the regions not inspected. DNC will provide this evaluation to the NRC prior to entry into Mode 4 following the refueling.

cc: U.S. Nuclear Regulatory Commission
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Mr. S. M. Schneider
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COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Eugene S. Grecheck, who is Vice President - Nuclear Support Services of Dominion Nuclear Connecticut, Inc. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of that company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 16th day of May, 2006.

My Commission Expires: August 31, 2008.

Margaret B. Bennett
Notary Public

(SEAL)

ATTACHMENT 1

RELAXATION OF THE REQUIREMENTS OF ORDER EA-03-009
(REQUEST IR-2-46)

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3

RELAXATION OF THE REQUIREMENTS OF ORDER EA-03-009 (REQUEST IR-2-46)

Proposed Alternative
In Accordance with 10 CFR 50.55a(a)(3)(ii)

- Hardship or Unusual Difficulty
Without Compensating Increase in Level of Quality or Safety -

1.0 ASME Code Components Affected

1.1 Reactor Pressure Vessel Head

The Millstone Power Station Unit 3 (MPS3) reactor pressure vessel (RPV) closure head was fabricated by Combustion Engineering, Inc., and has one 1.33-inch (nominal diameter) penetration for a vent line and 78, 4-inch (nominal diameter) penetrations. The bottom section of each 4-inch nozzle penetrates both the 7-inch carbon steel base material and 7/32-inch stainless steel cladding of the closure head and is held in place by a J-weld around the internal periphery of the nozzle-to-head junction. This bottom section of each 4-inch nozzle is made of SB 167, Alloy 600 material. The closure head penetrations with CRDM nozzles are used for the following functions:

Qty	Penetration Function	Thermal Sleeve
61	Full length rod control cluster assemblies	Yes
4	Core exit thermocouple (CET) instrument port columns	No
2	Reactor vessel level monitoring system (RVLMS) instrument port columns	Yes
11	Spare (1 previously dedicated to a CET function)	No

1.2 Core Exit Thermocouple (CET) Penetration Nozzles

This request is applicable to the 5 CET penetration nozzles that have threaded guide funnels attached.

2.0 Applicable Code Edition and Addenda

MPS3 is currently in the second 10-year Inservice Inspection (ISI) interval that began on April 23, 1999, and is scheduled to end October 23, 2008. The ASME Boiler and Pressure Vessel Code (ASME Code) of record for the current 10-year ISI interval is the 1989 Edition of Section XI of the ASME Code.

The MPS3 RPV closure head was built to ASME Code, Section III, 1971 Edition through Summer 1973 Addenda.

3.0 Applicable Code Requirement(s)

On February 11, 2003, the U.S. Nuclear Regulatory Commission (NRC) issued Order EA-03-009 (Order), establishing interim inspection requirements for reactor pressure vessel heads of pressurized water reactors. On February 20, 2004, the NRC issued the first revision to the Order, superseding the original. The order establishes a minimum set of RPV head inspection requirements as a supplement to existing inspection requirements contained within the ASME Code and NRC regulations.

Based upon criteria in Section IV.B of the Order, the MPS3 RPV head has a low primary water stress corrosion cracking (PWSCC) susceptibility. The category of low susceptibility is based on having less than 8 effective degradation years (EDY) and no previous inspection findings that require a classification of high susceptibility. The MPS3 RPV will have accrued less than 3 EDY by the end of the current cycle.

During the MPS3 spring 2007 refueling outage, Dominion Nuclear Connecticut, Inc. (DNC) is required to perform the nondestructive examinations (NDE) that are specified in Section IV.C(5)(a) and Section IV.C(5)(b) of the Order.

3.1 Requirements of Section IV.C(5)(a) of the Order:

"Bare metal visual examination of 100 percent of the RPV head surface (including 360^0 around each RPV head penetration nozzle). For RPV heads with the surface obscured by support structure interfaces which are located at RPV head elevations downslope from the outermost RPV head penetration, a bare metal visual inspection of no less than 95 percent of the RPV head surface may be performed provided that the examination shall include those areas of the RPV head upslope and downslope from the support structure interference to identify any evidence of boron or corrosive product. Should any evidence of boron or corrosive product be identified, the licensee shall

examine the RPV head surface under the support structure to ensure that the RPV head is not degraded."

3.2 Requirements of Section IV.C(5)(b) of the Order:

"For each penetration, perform a non visual NDE in accordance with either (i), (ii) or (iii):

(i) Ultrasonic testing of the RPV head penetration nozzle volume (i.e., nozzle base material) from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 2 inches below the lowest point at the toe of the J-groove weld on a horizontal plane perpendicular to the nozzle axis (or the bottom of the nozzle if less than 2 inches; OR from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 1.0-inch below the lowest point at the toe of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) and including all RPV head penetration nozzle surfaces below the J-groove weld that have an operating stress level (including all residual and normal operating stresses) of 20 ksi tension and greater. In addition, an assessment shall be made to determine if leakage has occurred into the annulus between the RPV head penetration nozzle and the RPV head low-alloy steel.

(ii) Eddy current testing or dye penetrant testing of the entire wetted surface of the J-groove weld and the wetted surface of the RPV head penetration nozzle base material from at least 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 2 inches below the lowest point at the toe of the J-groove weld on a horizontal plane perpendicular to the nozzle axis (or the bottom of the nozzle if less than 2 inches; OR from 2 inches above the highest point of the root of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) to 1.0-inch below the lowest point at the toe of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) and including all RPV head penetration nozzle surfaces below the J-groove weld that have an operating stress level (including all residual and normal operating stresses) of 20 ksi tension and greater.

(iii) A combination of (i) and (ii) to cover equivalent volumes, surfaces and leak paths of the RPV head penetration nozzle base material and J-groove weld as described in (i) and (ii). Substitution of a

portion of a volumetric exam on a nozzle with a surface examination may be performed with the following requirements:

1. *On nozzle material below the J-groove weld, both the outside diameter and inside diameter surfaces of the nozzle must be examined.*
2. *On nozzle material above the J-groove weld, surface examination of the inside diameter surface of the nozzle is permitted provided a surface examination of the J-groove weld is also performed."*

4.0 Reason for Request

DNC is required to perform examinations in compliance with Section IV.C(5)(b) of the Order, which requires either ultrasonic testing of nozzle surfaces below the J-groove weld or some combination of volumetric exam on nozzles with a surface examination of both outside diameter and inside diameter surfaces of the nozzle below the J-groove weld. Compliance with requirements of Section IV.C(5)(b) of the Order is not physically possible in the case of the 4 CET nozzles and the one spare nozzle that was dedicated for a CET function. As described below, the physical configuration of the lower portion of these nozzles precludes examination.

The 5 nozzles contain external threading on the lower 1-inch, and have a guide funnel attached and welded in place. Additionally, these 5 nozzles contain an internal taper at the lower 0.750-inch of the nozzle. The internal taper creates dissimilar and divergent inside diameter to outside diameter surfaces at the bottom of the nozzles below the J-groove weld. Based on comparison with similarly designed RPV closure heads, this distance is reasonably estimated at less than 1.0-inch. The precise distance of the nozzle base material between the lowest point at the toe of the J-groove weld (on a horizontal plane perpendicular to the nozzle axis) and the top of the funnel for each nozzle is not known. Determination of the extent of volumetric examination coverage possible below the J-groove weld can only be quantified by performance of the examination during the refueling outage.

The attached funnel does not allow access to the outside diameter surface, (preventing the application of a surface examination on the outside surface to meet requirements of Section IV.C(5)(b)(ii) of the Order). The inside diameter taper does not allow the seating of the ultrasonic transducers, (preventing a comprehensive volumetric examination on the lower 0.750-inch of the nozzle), and since the distance between the lowest point at the toe of the J-groove weld and the top of the funnel is not known, the operating stresses at the top of the funnel can not be established.

5.0 Proposed Alternative and Basis for Use

5.1 Proposed Alternative: (See Figure 1 on page 7)

During the MPS3 spring 2007 refueling outage, DNC intends to perform a visual examination in accordance with Section IV.C(5)(a) of the Order and an ultrasonic examination in accordance with Section IV.C(5)(b)(i) of the Order with the exception of the lower 0.750-inch of the 5 CET nozzles that contain externally attached funnels and internal tapers.

DNC proposes to substitute a surface examination for the lower portion of the nozzle where a volumetric examination in compliance with the Order is not practical. The proposed surface examination will be limited to the inside surface of the nozzle for the 5 nozzles that contain externally attached funnels and internal tapers.

5.2 Basis:

DNC considers that this deviation from the required examination coverage retains an acceptable level of quality and safety because the only portion of the nozzle that will not be fully interrogated by the ultrasonic examination method is a small region near the bottom of 5 nozzles, below the toe of the J-groove weld. Below the J-groove weld, the nozzle is essentially an open-ended tube and the nozzle wall below the J-groove weld is not part of the reactor coolant pressure boundary.

5.2.1 Industry Operating Experience:

Examinations of reactor vessel head penetration nozzles have revealed that cracks initiate only in regions where the stresses have been at or near the material yield strength. The source of these stresses is the J-groove weld region. Weld shrinkage in the J-groove weld region causes high residual tensile stress in the nozzle. High residual stress is necessary to initiate primary water stress corrosion cracking (PWSCC).

Because there is no operational loading, the residual stresses decrease rapidly with distance below the weld. Consistent with the decrease in stress levels, industry experience has shown that flaws are not expected in the unexamined low stress area unless they are the extension of a flaw already present in the weld. The weld area will be thoroughly interrogated by the volumetric examination.

5.2.2 Plant Specific Experience:

The MPS3 RPV head is of the 'cold head' design and therefore will have less than 3 EDY at the time of the inspection. In addition, the heats of material used for the penetrations at MPS3 have a low yield stress of 30 ksi. The instances of PWSCC that have been observed in the industry have occurred in plants with greater than 12 EDY and in material with yield stresses of more than 40 ksi.

5.2.3 Structural Integrity Evaluation:

A structural integrity evaluation of the five CET nozzles will be completed to support continued operation until the next inspection is performed. This evaluation will derive a minimum effective full power years (EFPY) estimate for the period of time it takes to reach the bottom of the J-groove weld area for any postulated undetected flaw in the regions not inspected. DNC will provide this evaluation to the NRC prior to entry into Mode 4 following the refueling.

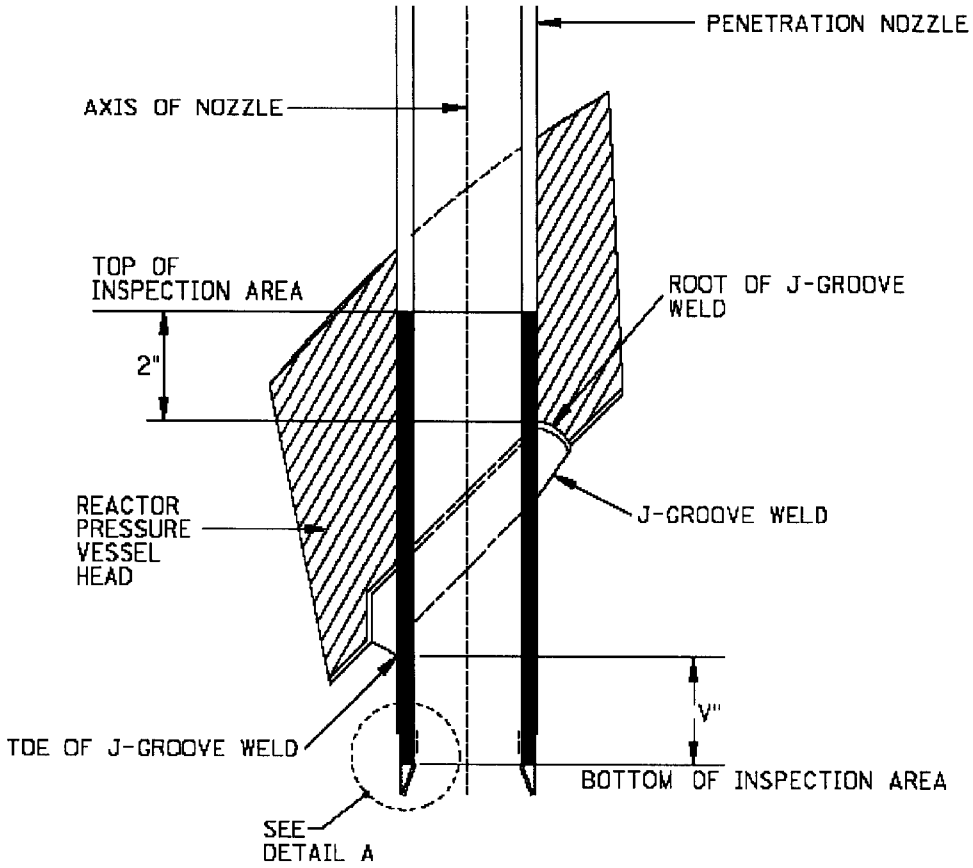
6.0 Duration of Proposed Alternative

The five CET nozzles that contain externally attached funnels and internal tapers have configurations that will prohibit compliance with examination coverage as specified in the Order. These same limitations are expected to apply should ASME Code Case N-729 become mandatory or supersede the Order in the future. Consequently, the proposed alternative is requested to support the examinations required by the Order in the upcoming MPS3 spring 2007 refueling outage. The proposed alternative would apply only during the period in which NRC Order EA-03-009 is in effect.

7.0 Precedents

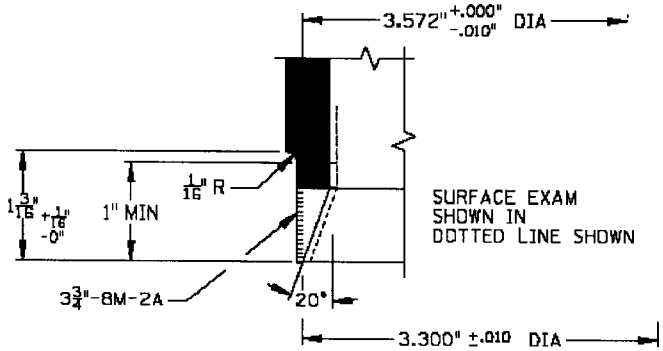
The examination limitations and the proposed alternative are analogous to other Combustion Engineering RPV heads with the exception that the threads and attached funnel at MPS3 are located on the nozzle outside surface rather than the nozzle inside surface. Several plants have received relaxation from the examination coverage requirements due to the threads and attached funnel located on the nozzle inside surface. Reference TAC No. MC0942, (ADAMS Accession No. ML033220099).

Figure 1: Proposed Examination Alternative



INSPECTION AREA USING COMBINED ULTRASONIC INSPECTION TECHNIQUE AND SURFACE EXAM
(NOZZLE AREA IN BLACK TO BE VOLUMETRICALLY INSPECTED.)

V = DIMENSION UNKNOWN BUT SUBSTANTIALLY LESS THAN 2" FOR CET TYPE NOZZLE.



DETAIL-A